elongated components, e.g. in the form of a screw or a strip-shaped mounting part, this results in particular possibilities of adaptation to the necessary strength ranges. The modulus of elasticity of screws manufactured from blanks with fibers aligned axis-parallel is correspondingly higher, in other words such screws tend to be stiffer. It has been shown that the use of an extrusion process makes a change in the fiber progression as compared to the fiber progression in the blank possible, so that additional adaptation parameters become possible by means of the special fiber orientation in the blank.

E1

Please amend the first two paragraphs on page 13 as follows:

A variant of the extrusion process as known from metal processing is used to manufacture the corticalis screw (e.g. with a core diameter of 3 mm) from PAEK (polyaryl ethyl ketone) reinforced with carbon fibers. A special variant provides for the use of PEEK (polyether ethyl ketone) reinforced with carbon fibers. The fiber orientation distribution and the mechanical properties of the screw are characterized and brought into relation with the process parameters of the manufacturing process.

E2

The fracture load of the screws manufactured using the extrusion process lies in the range between 3000 and 4000 N, the maximum torsion moment is between 1 and 1.5 Nm, where the maximum angle of distortion according to ISO standard 6475 is up to 370°. The screws possess a modulus of elasticity which decreases from the head towards the tip, and can be designated as being homoelastic with the bone.

E2

Please amend the fourth paragraph on page 14 as follows:

A blank element is heated to the forming temperature (e.g. 350-450 °C) in a heated extrusion die 8 (heating stage), where heating can also take place in consecutive heating stages 9 and 10 (Fig. 4). The blank 7 is therefore brought into the first heating stage 9, pre-heated accordingly there, heated further in the heating stage 10, and then formed in the negative mold in the region of stage 11. By means of the punch 12, the blank 7 is pressed into the negative mold (mold cavity) 13, and receives its final shape there. The pressing speed can be in the range between 2 and 80 mm/s in this connection. The pressing pressure was 120 MPa in various tests. During a subsequent post-pressure stage (pressure approximately 90 MPa), the

E3

die is cooled below the glass transition temperature of PAEK (143 °C), using compressed air. After the extrusion die is opened, the finished corticalis screw can be removed. In a subsequent analysis of a screw manufactured in this manner, it was shown that optimum values can be achieved in each instance. This results from the high proportion of fibers, the use of endless fibers, and the very specific forming process for manufacturing the screw.

E3

As is evident from Fig. 2, the fibers are aligned predominantly in the direction of the screw axis in the region of the head 2 of the screw 1. In the region of the screw tip, the fibers follow the screw contour (in other words the thread progression) in the edge region, while a random distribution of the fiber orientation prevails in the core zone.

Please amend the first two paragraphs on page 16 as follows:

E4

Using the example of a corticalis screw, it has been shown that components with complex geometry can also be manufactured by extrusion of thermoplastic materials reinforced with long fibers, in a hot-forming process. The fiber orientation distribution as the defining variable for the mechanical properties can be controlled, within certain

limits, by means of a suitable selection of the fiber orientation in the blank. The other process parameters investigated (forming speed and forming temperature) have a lesser influence on the result.

4/E The tensile strength of extruded PAEK lies about 30% below that of comparable steel screws, on average. An average fracture strength of 3200 N is sufficient for osteosynthesis applications, since a corresponding screw is already pulled out of the bone at a tensile force of 800-1300 N.

Please amend the last paragraph on page 16 as follows:

5/E With a modulus of elasticity between 5 and 23 GPa, the extruded corticalis screw is similar to the bone in its elastic behavior. The rigidity in the lengthwise direction clearly decreases towards the tip (decreasing rigidity gradient). In the screwed-in state, the rigid part of the screw (head region) is therefore close to the corticalis and therefore at the most rigid part of the treated bone. With such a rigidity distribution, a force introduction which is extensively adapted to the bone structure can be achieved.

Please amend the paragraph beginning "In the above description ..." on page 17 as follows:

In the above description, the point of departure was an extrusion process which is practically effective only in one direction. In this process, the blank is brought to a corresponding temperature (dough-like or honey-like flowing consistency) and then pressed into a negative mold. Within the scope of the invention, it is also possible to use a push-pull extrusion process, specifically for manufacturing strip-shaped, rail-shaped, or plate-shaped parts, but also for screw-like or other connection elements and also for special shapes of parts or for special structures of bolts, etc. Under some circumstances, a desired fiber orientation and fiber distribution can be achieved by multiple pressing back and forth, in other words by a multiple reversal of the pressing direction. Additional details in this regard will be explained at greater length on the basis of Fig. 6 and 7. The push-pull extrusion process can be of specific importance if, for example, dead-end holes, through openings, indentations, or special shapes are provided in the corresponding part. Then the special progression of the fibers can be influenced, and the component to be